

Sandians Win FBI's Thanks for Improved Diversionary Charge

When a police or military tactical team enters a room on a hostage rescue mission or other "surprise attack" situation, they sometimes use a diversionary charge to disorient their adversaries with a sudden loud noise and bright flash of light.

Often called "flash-bang grenades," these devices have been used in various forms since Israeli rescuers of hostages in Entebbe used military concussion grenades as a diversion. Now a Sandia team has improved on earlier designs, earning thanks from the FBI Hostage Rescue Team "for making our world a little brighter, louder, and a lot safer," in the words of a plaque given to the Sandians. The project began in 1989.

(The 50 members of the Hostage Rescue Team stormed a federal prison in Talladega, Ala., Aug. 30 and rescued all hostages held by inmates. Although the FBI does not comment on tactical details of such operations, published reports refer to devices used to produce a "flash and shock wave.")

Safety Was Prime Objective

Key members of the Sandia team were Ed Graeber (9514), Paul Cooper (9333), Stan Kurowski (ret.), and Wayne Ebaugh (ret.). The FBI sponsored their work, assembling a consortium of customers that also included military special forces. The consortium put together a set of objectives that would do away with several drawbacks of flash-bang grenades used since the late '70s.

Many of the objectives dealt with safety. The previous model used the body of an Army training simulator, with the 8-to-10-second fuze replaced by a 1-to-2-second fuze from a smoke

grenade. Although that FBI-originated combination worked reasonably well, its hybrid origin caused some problems.

"The consortium needed a fuze that would explode reliably after the specified delay," says Ed. "If the fuze flashed through and exploded the charge too quickly, the person holding the grenade

could be seriously injured or even killed. This was a particularly important consideration, because for every one of these thrown in a tactical situation, probably thousands are thrown in training."

On the other hand, if a fuze failure caused a dud in a tactical situation, a team poised for a split-

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SANDIA SECURITY Lieutenants Ray Page (3435, left) and Grant Aguirre (3438) use a flash-bang grenade in an exercise. Smoke from the grenade, more formally called a diversionary charge, drifts across one of the silhouette targets. A new device developed by Sandia produces the same disorienting noise with less smoke to obscure the vision of a tactical team entering after the grenade blast. (Photo by Randy Montoya, 3162)

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LAB NEWS

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Believe It or Not!

Sandia Invention on Display In Museum of Modern Art

When several Sandians developed flight goggles made from a new material called PLZT in the 1970s, they never dreamed the goggles would one day be displayed in the Museum of Modern Art in New York.

But — as strange as it may sound — that's exactly the case. The PLZT flight goggles, which protect pilots' eyes from the blinding effects of a nuclear flash, are included in a current Museum of Modern Art exhibit of 40 masks and helmets from 20th-century society.

The opaque PLZT (for Pb — or lead — Lanthanum-modified Zirconate Titanate) goggle lenses turn dark instantaneously in the presence of intense light such as a nuclear flash, then turn clear again so fast that the switch is virtually unnoticeable to the pilot. Developed by Tom Cutchen (2560), Jim Harris (2553), Jack Cyrus (ret.), George Laguna (2533), Bob Cutler (2714), Richard Adams (7301), and George Dulleck (2534), the goggles were first used by Air Force pilots in

1985. (Former Sandian Gene Haertling invented the ceramic PLZT material in 1969.)

The exhibit, which will be on display through Nov. 19, was organized by Associate Museum Curator Cara McCarty, who says masks from different cultures and epochs are part of the drama with which people face the unknown, reflecting



SANDIA goggles that protect pilots' eyes from the blinding effects of a nuclear explosion are currently part of an exhibit in the Museum of Modern Art (seen here attached to a flight helmet).

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Phase 1A Update

Unity Is Goal of Strategic Planning

In a planning process that began late in 1989 and will continue at least into 1992, the shape of the future Sandia is gradually being molded.

That process has led to an initial definition of Sandia's core competencies, setting the stage for more-detailed planning that will eventually determine where the Labs concentrates its resources. Sandia Management Council members and many other Sandians collaborated in Phase 1A of the process, building on the Phase 1 work that produced the 1990 *Strategic Plan*.

"We needed to weave together all the threads that run through Sandia's programs, projects, organizations, and capabilities," says President Al Narath. "We began by talking about strategic intent, but we soon adopted the term 'strategic unity.'"

A key outcome of Phase 1A is a preliminary list of Sandia's core competencies, the set of technical strengths that underlie many of the Labs' programs. (See "Core Competencies: A Preliminary List," page six.) The list is subject to change, but as it becomes firmer, it will have increasingly visible effects on Labs operations.

At the Leading Edge

"We will consciously build our future activities around the core competencies," says Al. "The definition of these competencies will be refined as they are considered in depth over the next year. Because of their strategic importance to the Laboratories and our customers, we will assign very high priority to maintaining our core competencies at the leading edge."

To convey the idea of strategic unity, SMC adopted the symbol of a tree that represents Sandia's contributions to national security, including both defense and economic issues. The roots

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This & That

Nominate a Quality Sandian - Here's your chance to recognize a fellow Sandian (or team) who has provided you with quality goods or services. Selected employees will be recognized next month during National Quality Month and will be highlighted in the LAB NEWS. Any Sandian can nominate another employee. It's a nice thing to do for someone who has done a nice job for you, and it's easy (see story at right).
* * *

S-orrry, S-andians! - I've come to appreciate, but not quite love, computers after we acquired a fancy desktop publishing system at the LAB NEWS several years ago. But my appreciation faltered badly after our last issue came out. A strange hyphenation disease infected our "unclassified ad" page. When the paper left our office (on a computer disk), all was fine. But when our contract printer printed the page, we got some weird hyphenations at line endings. In particular, we had lots of "s" problems, for example, S-pain, s-tand, and s-payd, plus some butchering of several employee names, including S-parks and S-jaardema. When I saw the page, I said something like, "Oh, s-hoot."
* * *

Family Day Schedule in Next Issue - Check our Oct. 4 issue for a listing of the times and places for the major Family Day activities on Saturday, Oct. 19. We're publishing this Oct. 4 so you and your family can plan early to see what interests you most. In the meantime, don't forget that youngsters (ages 13 and under) in your family can enter drawings in the "Kids' View" competition and maybe win one of three \$100 savings bonds. The deadline for entries is Sept. 27; see Sept. 6 LAB NEWS for details or call Joe Laval (3163) on 4-6531 for more info.
* * *

Looking for Funny Folks - Potential Porky Pigs and aspiring comics can contact Renee Philipbar (1932) on 5-8428 if you're interested in becoming locally famous (maybe infamous) on Family Day. Scientific Computing Directorate 1900 is planning to produce Family Day tapes for voice messaging and video conferencing exhibits and is looking for a couple of volunteers who can do cartoon voices and who have comedic skills. Now let's see - where did I put my glasses and funny nose?
* * *

Worth Repeating - President Al Narath is quoted in the September issue of *DOE This Month*, the Department of Energy's employee publication. His words are from a talk he gave before a national meeting of the American Physical Society this spring:

"The national laboratories, assisted by recent policy and legislative mandates, have an opportunity to enhance their value to the nation by helping to facilitate the difficult transition from [scientific] discovery to commercial exploitation. . . . We are a nation whose scientific community once urged the federal government to support a drastic step in reaction to threatened national security - and followed up by taking the 'bomb' from scientific discovery to mass destruction in only five years. Surely we are capable of sufficient resolve, speed, and endurance to counter the threat to our security that is posed by intensifying global economic competition."
* * *

No Escaping Them - Spotted in a display ad for ski equipment in an Albuquerque paper: "Metal edged skis ideal for backcountry touring or telemarketing."
●LP

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Modern-Art Goggles

the societies that make them. Twentieth-century masks and helmets, she says, have been designed almost exclusively for physical protection. Her exhibit includes motorcycle, welding, and ski racing helmets, gas and hockey masks, and helmets for fighting fires, diving, and space exploration.

McCarty saw the goggles in a photo in a December 1989 *National Geographic* article about materials sciences. She called Community Relations Div. 3163, and Joe Laval (3163) arranged for a current production model of the goggles to be shipped to her (manufactured for the Air Force by Polaroid). McCarty apparently saved "the best for last"; the Sandia goggles are the last in the 40-piece exhibit, notes Joe.

"Masks and helmets have a long tradition of being exhibited in art museums as objects worthy of artistic consideration," says McCarty, "and they remain an area that is extraordinarily rich in expressiveness."
●JG

Nominate a Colleague

'Quality' Employees Will Be Recognized During October

October is National Quality Month, an annual event promoted by the American Society for Quality Control (ASQC) to recognize quality processes in the workplace. During October, the LAB NEWS will publish several articles that focus on quality at Sandia.

As part of this year's National Quality Month, the Labs is recognizing some of Sandia's outstanding internal suppliers, employees who do a particularly good job of providing products or services to other Sandians. These Sandians will be highlighted in a future LAB NEWS "Spotlight on Quality" article.

"According to the customer/supplier model of quality processes," says Judith Mead (7730), "every Sandian is both a supplier and a customer, depending on the particular work activity, or process, being performed."

Easy to Nominate Someone

To nominate an internal Sandia supplier for recognition, she says, any Sandian may submit a brief (less than one page) description of how another employee (or team of no more than 10 employees) provides goods or services using quality principles to better meet customers' needs. The nomination should also describe how the supplier consistently demonstrates an understanding of quality principles, provides feedback when needed, and handles complaints quickly and responsibly. (Send nominations to Judith Mead, Dept. 7730, by Oct. 11, or call her on 4-3233 for more information.)

In addition to the quality recognitions, Sandia is participating in this year's Quality Month by sponsoring activities that help employees better understand how quality principles apply to their jobs (see box below).

The national event began in the early 1980s as a weeklong campaign organized by ASQC in Washington, D.C. The concept soon attracted support from Congress, and in 1984, the first National Quality Month took place. Since then, hundreds of companies, schools, and individuals have participated in Quality Month activities. The theme of this year's event is "World-Class Quality." ●

Monthlong Focus on Quality

National Quality Month activities at Sandia include:

- *Tuesday, Oct. 1* - ASQC 7th Annual Quality Forum with keynote speaker John F. Akers, IBM chairman; 8 to 11:30 a.m., Technology Transfer Center (Bldg. 825) auditorium.
- *Friday, Oct. 18* - Sandia Colloquium: "Quality in Health Care," with speakers Dr. Derick Pasternak, Lovelace Medical Center CEO, and Dick Barr, Presbyterian Health Care Services CEO; 9:30 to 11:30 a.m., Technology Transfer Center.
- *Thursday, Oct. 24* - Sandia Colloquium: "Quality in the Public Sector," with speaker Joe Sensenbrenner, past mayor of Madison, Wis., and consultant on the application of total quality management (TQM) in the public sector.
- *Wednesday and Thursday, Oct. 30 and 31* - 4th Annual AT&T Quality Conference (tape delay), with speaker Bob Allen, AT&T CEO; 8:30 a.m. to 12:30 p.m., Technology Transfer Center.



Maximizing Safety and Quality

New Group Takes Responsibility for Nuclear Explosive Electrical Test Equipment

A team has been formed at Sandia, Livermore to take responsibility for Nuclear Explosive Area (NEA) testers — the electrical equipment that is connected to nuclear explosives to check for proper operation of components during any phase of weapon production.

The need for this team grew from a recommendation of the Pantex Tester Review Committee, explains team leader Ron Amaral of Electronic Subsystems Div. 5376. Directors in Weapons De-

“We view it as imperative to continuously improve tester safety.”

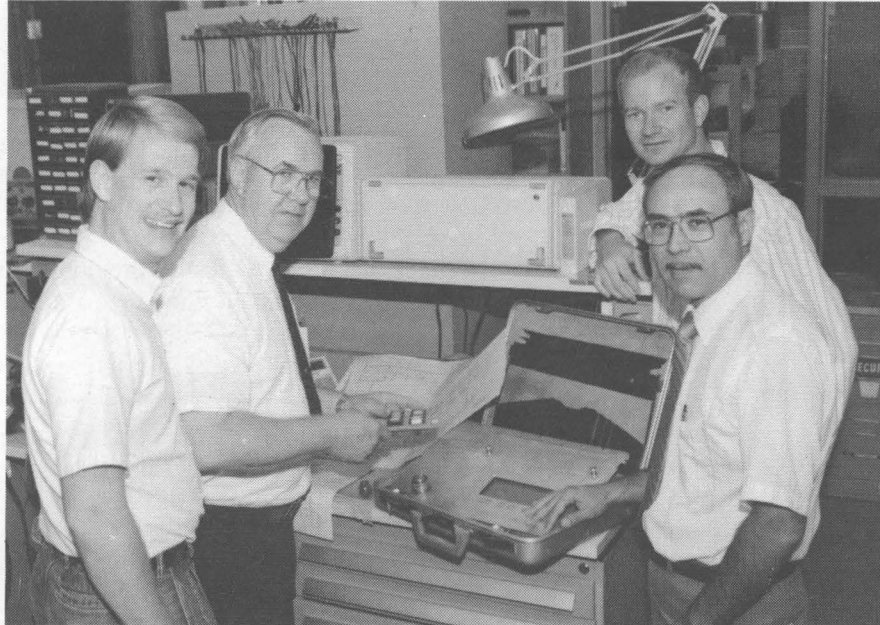
velopment and Systems Evaluation gave responsibility to Div. 5376. (The Pantex plant near Amarillo, Tex., handles the final assembly of nuclear weapons.)

“Until now,” says Ron, “Pantex didn’t have a single point of contact at Sandia for testers if questions or problems arose. Starting in April, we became that contact.”

Other team members are Jim Baumann, Del Hatch, and Curt Nilsen (all 5376), electrical engineers with diverse backgrounds in weapons work, use control, circuit modeling, and software engineering.

The group calls itself NETOG, for Nuclear Explosive Tester Oversight Group. Its mission, as stated in its newsletter, NETOG NEWS: “To generate and formalize nuclear-safety critical NEA tester-design criteria, develop and implement a process to establish and maintain tester compliance with these criteria, and assume life-of-tester design responsibility for all NEA testers.” The newsletter explained NETOG’s services and activities to more than 200 customers in DOE’s nuclear weapon complex — the designers, builders, and users of electrical testers used during assembly of nuclear explosives.

Assuming responsibility for the life cycle of testers means that NETOG members will be in-



CHECKING the Nuclear Explosive Assembly tester in Bldg. 910 are (from left) Curt Nilsen, Jim Baumann, Del Hatch, and Ron Amaral (all 5376).

involved in the design, analysis, modification, use, and retirement of NEA testers. NETOG will also be directly involved with more than 30 types of testers on DOE’s Master Tester list. These range from Permissive Action Link controllers and simple ohmmeters to large, multibay rack testers.

Nuclear Safety Assurance Plan

Ron says the team sees itself as fulfilling part of the Labs’ Nuclear Safety Assurance Plan that went into effect last October. The plan describes how Sandia is to operate to ensure that all nuclear safety responsibilities are addressed and properly implemented. “Testers have operated safely for years,” says Ron. “However, we view it as imperative to continuously improve tester safety. We must do everything within reason to maximize the safety, quality, and security of nuclear weapons.”

Curt says NETOG is issuing a significantly revised design guide for electrical testers for use with nuclear explosives. The new version will provide guidance on alternating-current isolation, software, and other topics not addressed in previ-

New Safety Analysis in 1992

Starting in January 1992, all nuclear explosives testers will be subject to a new safety analysis as part of DOE Nuclear Explosive Safety Study Group (NESSG) activities. Recommended or required modifications to these testers will be part of the Tester Improvement Program and will allow existing testers to be modified to include all the latest safety features. NETOG is currently surveying and prioritizing NEA testers for upgrades.

ous issues. The guidelines also recommend that barriers be placed around critical components to provide protection in the unlikely event of a fire, mechanical crushing, overvoltage, or overcurrent.

NETOG is also studying current limiters, a key safety feature of a tester. These help prevent energy from reaching the explosive in the case of exposure to an abnormal environment. Del Hatch is leading the effort to ensure that these limiters are safe and reliable. ●

Attention, Volunteers

Pilot Program Helps Schools

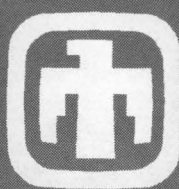
A pilot program at Sandia, Livermore will help local schools overcome fiscal and staffing problems. The “School Links” volunteer program is providing assistance this fall to schools seeking help in specific classes and programs.

A survey of Sandians in August showed 140 employees were interested in volunteering up to four hours a month. Cindy English (8522) is matching their talents with schools’ requests.

Commenting on the program, VP John Crawford (8000) notes, “For years — at the annual appreciation luncheon of the Corporate Volunteer Council — we have been recognizing volunteers who have given their time to schools and other worthwhile community programs. Now we want to carry this a step further and permit Sandians to take up to four hours a month out of their workdays to help schools facing severe budget and staffing cuts. We want to be a good neighbor to our local communities, and this is one way to demonstrate our commitment.”

Sandia is also helping schools with math and science programs through the Livermore Science Advisory Panel and Educational Outreach, coordinated by Employee Services Div. 8526.

Sandians who wish to take part in School Links may contact Cindy on 4-2723. ●



SANDIA LIVERMORE NEWS



REAR ADMIRAL GERRY ELLIS, DOE Deputy Assistant Secretary for Military Application, toured Sandia, Livermore recently and was briefed on the W89 program, the Tritium Research Lab, materials science, and the supercomputer consolidation plan. Participating were (from left, seated) Ellis; Debby Miller, DOE/KAO administrative branch chief; President Al Narath; (back row) VP John Crawford (8000); Sheldon Kahalas, Director of DOE’s Office of Research and Advanced Technology; and Dick Fredlund, DOE/SAN.

Congratulations

To Carol Caldwell (8543) and Charles Fleischmann, married in Berkeley, Aug. 24.

To Diane Atwood (8275) and Don Veca (ret.),

married in South Lake Tahoe, Aug. 24.

To Rick Wayne (8400) and Carol Egan, married in Livermore, Sept. 1.

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Flash-Bang Grenade

second operation could be compromised.

Another need for the new grenade was to eject the fuze at a low enough speed to prevent injury — the old one could blow off the metal fuze assembly fast enough to penetrate 3/4-inch plywood, obviously fast enough to injure or even kill. Still other needs were to reduce the amount of smoke produced, so the entry team could see, and to avert the fire hazard of smoldering cardboard from the case of the earlier grenade.

"In developing the body material," says Ed, "we came up with a special polyurethane foam. It's black for night use — it has a white label, but the label can easily be peeled off to make the device virtually invisible at night. The foam includes a fire retardant, so you don't have the old problem of smoldering pieces of cardboard that could lodge in something flammable and cause a fire later. Also, when the grenade blows,



CUTAWAY MODEL

ONE FOR SHOW, one to throw — Ed Graeber (9514, right) displays a cutaway model of a new flash-bang grenade, while Paul Cooper (9333) holds the real thing. The white label peels off easily for night use, and the polyurethane body can survive being stepped on.



Scoring the Flash and Bang

Measuring Grenade Performance Led to Test Criteria for Production

"We did hundreds of tests on existing diversionary charges," says Paul Cooper (9333), "because no one had really characterized their performance before. The users in the FBI and special military forces knew in qualitative terms what they liked about it and what they wanted to improve, but there were very few reliable numbers."

The Sandia tests established previously unknown facts — for instance, the fuze assembly is normally ejected at 80 feet per second and sometimes as fast as 180 fps. Measurements of

smoke, noise, light, and other characteristics — sometimes requiring newly developed measurement techniques — established a data base that makes it possible to set performance standards for the manufacturing process.

"For the 10,000 grenades that we're supplying to the FBI," says Paul, "samples from each lot have to pass tests for fuze ejection velocity, smoke and light output, survival of submersion in water, and blast pressure, which determines the noise."

the foam breaks into small fragments that won't hurt anybody who's hit by them. And it's strong enough that the grenade can survive being stepped on."

New Charge, Less Smoke

The charge is a mix of carbon, aluminum, and potassium perchlorate, which produces the same initial blast overpressure — the source of the noise — as the old device, but with less than half the smoke. The peak light output is the same, though the total light output over time is less. "These are common fireworks materials," says Ed, "but this is hardly a firework. It's much more complicated, with the fuze and the special case material."

The old model contains magnesium, alu-

minum, and an oxidizer. One drawback to this — in addition to excessive smoke — is that the magnesium can oxidize and cause the grenade case to swell and burst if it gets moist.

For the new fuze, the team worked with a contractor, Ensign Bickford Aerospace Company. The fuze is molded as a single piece of plastic, leaving no crack or gap that could allow the burning fuze

"For every one of these thrown in a tactical situation, probably thousands are thrown in training."

to flash through and explode the charge prematurely. The delay is a reliable 1.5 seconds, instead of the variable 0.7 to 2 seconds with the old fuze. A small separation charge blows the fuze off at low speed just before the main charge explodes. And the new fuze is rugged — air-gun tests show that it can survive impacts of 50 feet per second, harder than it would ever be thrown in use.

Ensign Bickford is producing the lot of 10,000 called for by the agreement with the FBI. "After that initial lot," says Paul, "the design will be available to other agencies that want to have it manufactured. The services could use it for general training, but at this point we don't know who will adopt it."

Ed adds, "The production price per grenade is about \$29 each, which is less than the customers' objectives at the outset of the project. We're working now on further simplifying the design to make the production cost even lower." Even modest decreases in the per-unit cost could amount to a sizable total, he points out: "Nobody knows for sure how many of these devices are used every year, but the best guess is 100,000 or more. That multiplier produces a lot of savings for every dollar we can trim out of the cost of each." ●CS

More Info Coming Soon

Meetings Scheduled for HMO Medical Option

Orientation meetings have been scheduled in the Albuquerque area for employees and retirees who may be interested in the new Health Maintenance Organization (HMO) option for health care.

The HMO option is the Lovelace Health Plan, with coverage to become effective Jan. 1, 1992, as an *alternative* to the Medical Care Plan administered by Mutual of Omaha (see LAB NEWS, Aug. 23).

Meetings for employees will begin Oct. 14 and continue daily through Nov. 1. A complete schedule of employee meetings will appear in the Oct. 7 *Weekly Bulletin* and will be repeated weekly throughout enrollment. Spouses may attend any session held outside the secure areas.

Meetings for employees and families who live east and south of Albuquerque are scheduled for Oct. 14 and 22 at the UNM Valencia Campus Lec-

ture Hall in Tomé at 7 p.m., and at the Los Vecinos Community Center in Tijeras Oct. 16 and 23 at 7:30 p.m.

Meetings for retirees and persons eligible for temporary continuing coverage under COBRA will be held daily (Mon.-Fri.) at the W. R. Lovelace II Education Building Auditorium, 5400 Gibson Blvd. SE, Albuquerque, the weeks of Oct. 14-18 and Oct. 21-25 at 8:30 a.m. and again at 10:30 a.m.

Four meetings will be held at the Lovelace Family Practice Office, 3801 Southern Blvd. SE, Rio Rancho, Oct 15, 16, 21, and 23, each starting at 1:15 p.m.

Meetings will also be held at the Coronado Club's Fiesta Room each day during the week of Oct. 28-Nov. 1, beginning at 9 a.m. and at 1:15 p.m.

Spouses may attend any meeting that is convenient. (Note: Surviving spouses of Sandians are not eligible for the HMO but will continue to receive coverage under the Medical Care Plan if they have elected it.)

Open houses for employees, retirees, and families are being planned for the weekends of Oct. 12 and 26. The schedules will be published in the Oct. 4 LAB NEWS.

Detailed information packets will be mailed the week of Oct. 7 to the homes of all employees and retirees in the Albuquerque area. The packets will include schedules and directions to all meeting locations, as well as a summary comparison between the Medical Care Plan and the HMO option. These packets should be reviewed carefully before attending a meeting and before choosing whether to enroll in the HMO. ●

Nichols Is Three-Time Winner**Sandians Win R&D 100 Prizes in 1991 Competition**

Sandia has its first three-time winner in the R&D 100 competition, in the person of Monte Nichols (Organic and Composite Materials Div. 8311), recognized for his participation in a team that developed an X-ray tomographic microscope.

Two other 1991 R&D 100 winners — among those honored by *R&D Magazine* for the "100 most significant new technical products" of the

The three 1991 awards bring Sandia's R&D 100 total to 18.

year — are a Sandia research team that developed improved hardware for recovery of synchronization loss in encrypted data and another Sandia team that developed the first electrically controlled semiconductor device that changes reflectance for 1.06-micrometer light — a popular laser wavelength.

The developers of the cryptographic synchronization loss detector are Lyndon Pierson, Joseph Maestas, and Tom Pratt (all Computer Communications Design Div. 1934). The team that developed the semiconductor device, called a reflectance modulator, consists of Ian Fritz (Semiconductor Physics Div. 1143), Allen Vawter, Dave Myers (both Device Research Div. 1141), Gene Hammons, and Tom Brennan (both Semiconductor Materials Div. 1144). (The five winners from Solid State Sciences 1100 are in the process of a transition to divisions in Microelectronics and Photonics 1300, created by the Aug. 1 reorganization.)

Monte, Dave, Lyndon, Joseph, and Tom Pratt were present as the awards were handed out last night at Chicago's Museum of Science & Industry. Other Sandians in attendance were Dan Arvizu, Director of Technology Transfer and Industrial Relations 4200; Dona Crawford, Director of Scientific Computing 1900; and Mike Vahle, Supervisor of Div. 1934.

CT Looks Inside Materials

Monte and his fellow team members developed a microscope that uses computed tomography (CT) to image microstructures of materials

Congrats from Secretary Watkins

Secretary of Energy James D. Watkins says, "I am delighted to learn that DOE laboratories this year won 36 R&D 100 awards. I congratulate the Sandia researchers. Obviously they have taken to heart one of the Laboratories' most important missions, technology transfer, and are making innovative technology available for the benefit of the country."

without sectioning the material. The other team members are from Lawrence Livermore National Lab, the Georgia Institute of Technology, and Materials Data, Inc.

Their instrument can create images with approximately 100 times better resolution than a conventional medical CT scanner. The X-ray tomographic microscope is especially valuable for studying composite materials because it can look into their interior to see formation of cracks, before failure, of materials under load.

Monte is the only Sandian who has received more than one R&D 100 award. In 1988, he was recognized, along with Lawrence Livermore researchers, for development of a 3-D chemical X-ray microscope. In 1986, Monte and Dale Boehme (8313) won the award for developing an X-ray microanalyzer that measures various properties of micron-sized materials samples.

The reflectance modulators developed by the 1100/1300 research team are compound semicon-



REFLECTANCE MODULATOR for transmitting and receiving optical signals — an R&D 100 winner — was developed by this Sandia team: (from left) Tom Brennan (1144), Allen Vawter (1141), Ian Fritz (1143), Gene Hammons (1144), and Dave Myers (1141). They're in the Compound Semiconductor Research Lab, in front of a molecular-beam-epitaxy reactor where the materials for the modulator were grown.

ductor devices constructed using strained layer superlattices (SLS), which were pioneered at Sandia in the early 1980s. SLSs consist of layers so thin that the atoms will line up with those of a different material easily, without causing defects such as threading dislocation. This permits fabrication of semiconductor materials with completely new electronic and optical properties.

The SLS techniques used in developing the electrically controlled reflectance modulator can be used to construct devices that function over a wide range of wavelengths, depending on the intended application.

Because they can receive and reflect light waves generated from a distant source, these devices have their greatest potential applications in communication systems. Electrical signals at the modulator impress information on the reflected beam, allowing messages to be sent from a remote location with low power.

Sync Loss Detector Works Fast

The cryptographic synchronization loss detector developed by the Computer Communications Design Division team protects encoded information from being lost by improper synchronization between the encryption and decryption processes.

Synchronization loss occurs when more or fewer computer information bits are received for

(Continued on Page Six)



CRYPTOGRAPHIC SYNCHRONIZATION loss detector was developed by (from left) Lyndon Pierson, Tom Pratt, and Joseph Maestas (all 1934). The two boxes on the bench are the version that won an R&D 100 award; Joseph is holding a newer, smaller, faster version that's in the prototype stage.



MONTE NICHOLS (8311, right) and John Kinney of Lawrence Livermore National Laboratory talk about the X-ray tomographic microscope, an R&D 100 award winner, that their research team developed. Besides Sandia and Lawrence Livermore, the team included researchers at Georgia Tech and Materials Data, Inc.

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Strategic Planning

of the tree are the core competencies; the trunk represents conversion of the competencies into Sandia's major lines of work, which are in turn symbolized by the branches. The tree is grounded in the Labs' corporate values of teamwork, integrity, quality, leadership, and respect for the individual.

The symbolism of the tree conveys several important points, says Al. "We will focus on opportunities to enhance national security, and as we contribute to national security, we will help ensure the success of our primary customer, the DOE.

"As a member of the DOE team, we of course have the American taxpayer as our ultimate customer. But we will be working very directly with industry and academia, and it is these institutions that will judge our worth. We must demonstrate that we are adding value to them. We also must partner with industry even more frequently, which means we have to match industry's pace — and in

Where to Send Ideas About Core Competencies

Sandians who have ideas or suggestions about the Labs' evolving list of core competencies may convey them to Venky Narayanamurti, VP-Research and Exploratory Technology 1000. Venky is the Sandia Program Council member responsible for core competencies.

some cases exceed it."

"Our nuclear weapon program will still be an enduring responsibility," continues Al. "Recent events in the Soviet Union illustrate how unpredictable the world is and suggest how important that basic mission remains.

"The combination of nuclear weapon work and other programs — such as energy and environment — will provide the resources necessary to support our core competencies, which form common roots for all our programs. We may develop new competencies if needed to meet future national security needs."

Business Plans Being Formed

The results of Phase 1A have been fed into the next step of the process, Phase 2. During Phase 2, planners at various levels are formulating a hierarchy of business plans for the Labs. The first cycle of plans is expected to be complete in the spring of 1992.

To develop the business plans, Sandia top management is working with managers of Sandia's program activities, with the managers responsible for developing and strengthening core competencies, and with the people responsible for various new initiatives. The completed plans will describe what Sandia intends as its technical and programmatic makeup at the end of the next five years.

The plans will specify investments in equipment, facilities, and people required to achieve that makeup. They will also indicate where the Labs should stop investing.

During the Phase 2 process, the statement of

Core Competencies: A Preliminary List

The list of core competencies developed during strategic planning Phase 1A consists of the following:

- Systems engineering.
- Engineered materials and processes (including materials, materials/processes, and engineering analysis and materials).
- High-performance computing (including software and scientific engineering computing).
- Microelectronics/photonics (including photonics, optics, and electronics).
- Engineering sciences/simulation (including engineering modeling and synthesis, modeling of complex systems, engineering analysis, mechanics, aerodynamics, fluid dynamics, heat transfer, pulsed power, combustion, and geosciences).
- Test and evaluation.

This is a general, preliminary list that will be focused and made more specific as needed to meet issues of competition and financial constraints.

strategic unity and core competencies developed in Phase 1A helps management evaluate how well each new proposal will fit the Labs' future, and it will continue to help integrate plans and ideas from throughout the Labs. ●CS

(Continued from Preceding Page)

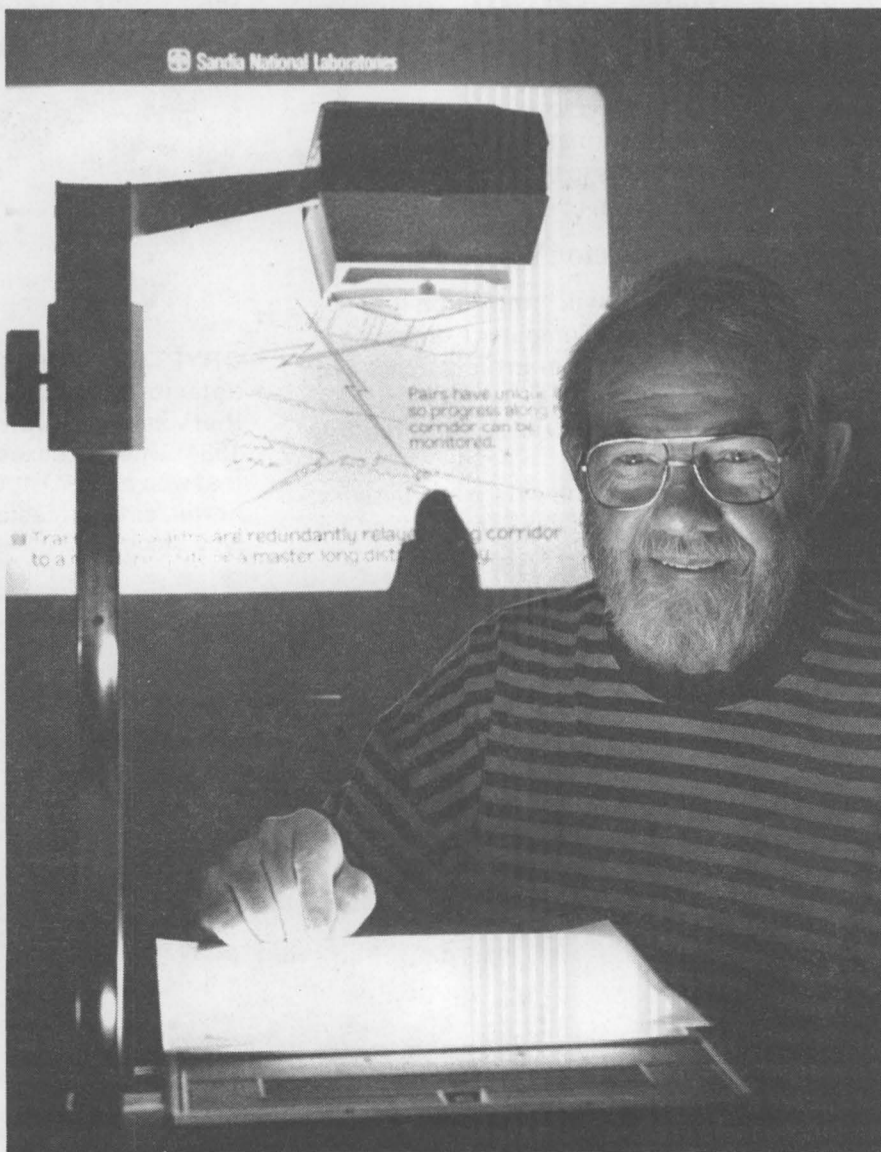
R&D 100 Awards

decryption than were encrypted. When this occurs, the information is garbled. This problem has become more common in recent years because current loss-detection devices cannot operate reliably at the higher circuit speeds made possible by advanced technology.

The Sandia hardware is designed to operate at communications rates 25 times faster than present rates and detect synchronization losses up to 50 times quicker than alternative synchronization loss detection devices. It does this by using a series of electronic counters and comparators to determine that received data is not coherent.

The three 1991 awards bring to 18 the total of R&D 100 awards Sandians have received since 1976. ●AEtheridge(3161)

LONGEST-SERVING SANDIAN — After 45 years, Jack Suttman (9135) holds the record for time spent working at the Labs. Jack's contributions as a graphic artist include designing the current version of the Sandia thunderbird logo, the LAB NEWS masthead, the LAB NEWS Feedback logo, and the production system for several Sandia publications, including *Sandia Technology*. For the past 10 years, he has done graphic art for presentations aimed at getting new business in conventional weapons R&D. At one time, Jack was instrumental in arranging native New Mexican-style service awards, such as belt buckles and jewelry that bore the Sandia logo. He originated Sandia's graphic design section, which is now part of Illustration and Design Communications Div. 3155. Jack joined the Labs Sept. 9, 1946; he retires Oct. 4. (Photo by Randy Montoya, 3162)



Take Note

The third annual Equestrian Cup Wine and Food-Tasting Benefit for All Faiths Receiving Home will be held Saturday, Sept. 28, at the Equestrian Arena at the NM State Fairgrounds from 12:30 to 4:30 p.m. Proceeds will go to the Albuquerque Children's Safehouse Project. The event includes nationally selected wines and food from Albuquerque's finest restaurants, plus a nationally sanctioned hunter jumper equestrian competition and an arena polo exhibition. Cost is \$20 per person or \$35 per couple. For information, call Rick Davis on 822-1005.

On Thursday, Sept. 26, the New Mexico Wildlife Federation will discuss federal bills pending before Congress that deal with protection and logging of ancient forests and other forests on public land. The presentation will be at 7 p.m. in the UNM School of Law's main lecture hall, Rm. 101. There are a number of bills pending that would affect forests with trees between the ages of 200 and 2,000 years found in the Pacific Northwest. Certain bills seek to protect most, if not all, of these last remaining stands from logging. The presentation is free and open to the public.

Welcome

Albuquerque — Nikki Chavez (21-1), Viola Ekdahl (21-1), Vicki Northington (21-1), Angela Ortiz (21-1), Vicki West (21-1).

Elsewhere: Mississippi — Daniel Cress (9134).



This newspaper can be recycled with Sandia office paper

Turn Someone's Life Around**United Way Agencies Benefit from ECP Contributions**

The Employee Contribution Plan (ECP) campaign, now in its 35th year at Sandia, will be held during the week of Oct. 7.

During these 35 years, Sandians have developed a reputation for generosity to the community, and through their ECP contributions have helped thousands of Albuquerque-area people. In 1957, Sandians' ECP contributions helped people through 24 United Way agencies. Today, that number has almost doubled, to 45. To help us all better understand how our contributions help people, the LAB NEWS is publishing the following complete list of United Way agencies and summarizing their services.

Adelante Development Center: Provides vocational and daily-living skills training to severely handicapped and developmentally disabled adults in Bernalillo and Valencia counties.

Albuquerque Bar Association Volunteer Lawyers: Provides legal services to low-income Bernalillo county residents.

Albuquerque Shelter for Victims of Domestic Violence: Provides shelter, food, clothing, advocacy, and treatment primarily to women and their children in immediate danger of abuse or who have been abused.

Albuquerque Speech, Language, and Hearing Center: Provides outpatient, therapeutic treatment for children and adults with speech, language, and hearing disorders.

All Faiths Receiving Home: Provides residential shelter and care to abused, neglected, and abandoned children.

Alta Mira Specialized Family Services: Provides early childhood services, respite care, and family support services for developmentally disabled persons.

American Cancer Society — Bernalillo County Unit: Provides educational programs on prevention, early detection, and treatment of cancer, as well as service and emotional support for cancer patients. Funds cancer research.

American Diabetes Association — New Mexico Affiliate: Offers public education about diabetes, conducts detection screenings, and provides patient education programs such as diet planning, meal preparation, and insulin therapy.

American Heart Association — New Mexico Affiliate: Conducts public and workplace education programs about heart disease, offers training and educational opportunities for medical personnel, and funds research.

American Red Cross — Mid Rio Grande Chapter: Provides assistance to victims of disasters. Offers AIDS information and training in CPR, first aid, water safety, and health.

Arthritis Foundation — New Mexico Chapter: Operates therapeutic exercise pool for individuals with arthritis and provides education, and funds research.

Association for Retarded Citizens of Albuquerque: Provides residential supervision and training for mentally retarded children and adults.

Big Brothers/Big Sisters of Albuquerque: Recruits, screens, and trains adult volunteers to be matched to single-parent youngsters ages 8 to 14.

Boys and Girls Clubs of Albuquerque: Provides a program of social development activities for boys and girls ages 6 to 18.

Boy Scouts of America — Great Southwest Council: Assists young people ages 6 to 21 in character development, citizenship training, and personal fitness.

Camp Fire — Tierra del Sol Council: Provides before- and after-school programs in elementary schools.

Career Services for the Handicapped: Provides employment services for adults with physical, mental, and learning disabilities.

Catholic Social Services of Albuquerque: Provides counseling, assistance to the elderly, home care, immigration and naturalization assistance, and refugee resettlement services.

Chaparral Girl Scout Council: Encourages growth for girls ages 5 to 17 through educational and recreational programs offered year-round, including the traditional camping program.

Christina Kent Day Nursery: Provides preschool training for children from low-income working families.

Cornucopia Adult Day Care: Program serves senior citizens and other adults with mental, emotional, and physical disabilities.

Easter Seal Society of New Mexico: Provides services for senior citizens and persons of all ages with disabilities.

Family and Children's Services: Provides counseling to individuals and families, offers "Parentcraft" (a parent education program), and offers an educational program addressing statewide maternity/adoption services and issues of concern to families.

Hogares: Provides counseling and residential treatment services for troubled adolescents and their families.

HomeCare Homemakers: Provides light house-keeping, meal preparation, errand services, and non-medical personal care for handicapped, elderly, and others in need.

KAFB Youth Activities Program: Offers leisure-time, social, recreational, educational, and vocational programs including before- and after-school care for school-age dependents of active-duty, retired military, and base civilian employees.

La Mesa Community Day Care and Preschool: Provides day care for children from low-income families in the La Mesa neighborhood.

Martineztown House of Neighborly Service: Provides social services primarily for residents of the Martineztown area.

National Council on Alcoholism and Drug Abuse, Albuquerque Area: Combats substance abuse and alcoholism through public education and prevention efforts.

National Kidney Foundation of New Mexico: Provides emergency financial aid, assistance with prescribed medication, and other special services for New Mexicans with kidney disease.

New Mexico Council on Crime and Delinquency: Offers community education, information, and advocacy relating to the prevention and control of delinquency and crime.

Peanut Butter and Jelly Preschool: Offers early intervention and prevention programs for young children and infants who are not developing normally or who are in extremely high-risk situations, and for their dysfunctional families.

Rehabilitation Center: Provides vocational training and sheltered employment, a preschool for disabled children, and speech, occupational, and physical therapies for children and adults.

St. Mark's in the Valley Day School: Provides day care and early childhood education for children ages 3 to 5 in a private, nonprofit, non-sectarian center.

St. Martin's Hospitality Center: Offers daytime emergency shelter for homeless and transient persons.

Share Your Care Adult Day Care Center: Provides day care for the frail elderly and handicapped.

Salvation Army: Provides clearinghouse for local and transient families in need of help and assists with food, lodging, etc., and offers youth social development and other community services.

Southwest Communication Resources: Provides child abuse prevention, in-home intervention services, and parenting education in Rio Rancho and Bernalillo.

Transitional Living Services: Serves adults with chronic mental illness in residential group home, semi-independent men's apartment living program, and peer outreach programs.

USO (United Services Organization): Provides network of services to members of US Armed Forces in foreign locations. Assists Albuquerque military families whose assignments take them outside this community.

UNM Medical Center Health Programs: Albuquerque Rape Crisis Center — Supports rape victims with a 24-hour crisis line, advocacy at the hospital, counseling, special prevention programs for all ages, and workshops for professional groups. **Suicide/Crisis/Emergency Telephone Service** — Crisis intervention on a 24-hour basis; provides education and training.

Villa Santa Maria: Provides non-sectarian, therapeutic residential group home for neglected and abused boys ages 7 to 14.

YMCA of Albuquerque: Offers fitness and values education for the family through physical, social, recreational, and educational programs.

YWCA of Albuquerque: Provides a full range of programs and services for women in the community, including job placement and counseling service; resource center for women beginning or managing their own businesses; Cariño child-care information and referral service; child-care center; educational, recreational, and health programs; and seasonal day camps.

Youth Development: Provides juvenile delinquency prevention services for youth ages 5 to 21. ●JC

Favorite Old Photo

NOT THE San Francisco Giants, but they were tough competitors in the Iowa State League in 1919. This photo was taken in front of my grandfather's grocery store in Des Moines. The blank-appearing sign held in front actually said "Iroquois Baseball Team #98." My grandfather is in the back row, under the letter "S" in the window. (One pane of the window had been broken and replaced, but never re-lettered.) Two of my uncles are batboys, and one of the players is my great-uncle. The photo was taken by my great-uncle Fred Bandholtz.
— Roger Busbee (8451)

feed **back**

Q: I have read concerns recently in the LAB NEWS and TLC letters about the availability of showers for employees. My question is, when do people use these showers? If they can't take a shower before coming to work, I see no reason why Sandia funds must be used for their personal hygiene. During the 15-minute morning coffee break, 30-minute lunch break, and 10-minute afternoon break, there is hardly time to suit up, exercise, shower, and change back to work clothes. Is there a case number that can be charged for shower time? (Please respond to this in the LAB NEWS, as many people are interested in this.)

A: The TLC Program (3300) is committed to creating a supportive environment for Sandians engaging in healthy behaviors such as physical activity. Most TLC fitness classes take place before or after work, and most TLC participants do not need access to a shower. However, TLC does provide a list of shower locations to Sandians who request the information, many of whom commute to work by walking and/or cycling and require a shower before starting their work day.

Currently, there is no case number to which Sandians may charge participation in TLC programs. Some non-represented employees have opted for a flexible work schedule, such as coming to work earlier or staying later, to attend lunchtime TLC programs. For Sandians who can't alter their schedules, TLC continues to increase class offerings during non-working hours and to offer shortened versions of lunchtime classes and seminars.

Except for attendance at formal TLC classes, exercise and shower time should be done outside work hours; therefore, use of a case number is not an issue.

Larry Clevenger (3300)

Q: Why are there no more refund envelopes in the Bldg. 880 vending machine area? The machines (especially the coffee machine) have not been running well lately. Is there some connection between poor operation and the lack of envelopes?

A: Sandia has very little control over vending services on its premises. The vendor for these services is selected by and under contract to the New Mexico Commission for the Blind, in cooperation with DOE. Linda Stefoin (3543) can report any problems such as the ones you describe to the vendor, Canteen Food Services, or you may call the vendor directly. Linda's number is 4-7433; Canteen's number is 344-3481.

Ralph Bonner (3500)

Q: A pile of trash on a skid was left outside the southeast gate of Bldg. 868 for three months or more. The ES&H person for 868 tells me that the light fixtures and old heater are contaminated with asbestos and cannot be placed in a safer location. However, the exposure to weather has probably reduced the asbestos hazard to near zero. Can Sandia not dispose of this material?

A: Gabe King of Rinchem Inc., the contractor of non-facility asbestos equipment and materials for Div. 7721, which handles waste disposal requests, checked the status of the skid of materials in question on July 19. He found that the material had been picked up on June 12.

The way Sandia's Waste Disposal Program works, Div. 7721 doesn't know about a material without receiving a request, at which point employees determine the hazards involved and arrange for handling and storage. They then pick up the wastes on a scheduled basis.

In the case of asbestos-containing materials, the requester must decide if they are "facility" or "non-facility." Facility asbestos includes ceiling tiles, floor tiles, insulation, pipe insulation, or other building structures. Non-facility asbestos refers to

pieces of equipment, gloves, aprons, and the like. The person to contact for disposal of facility asbestos is Tim Petersen (7853) on 6-0612; for non-facility asbestos, Gabe King on 269-5985. If it is not clear whether materials contain asbestos, David Sepulveda (7711), on 4-0813, is the person to contact for an inspection.

At the start of the Tiger Team visit to Sandia, material pickups were put on hold because of a shortage of employees and higher priorities. Non-facility pickups were reactivated June 10.

Further questions about Sandia's Waste Disposal Program may be directed to Lewis Marlman (7721) on 4-2699.

Nestor Ortiz (7700)

Q: Recently I received a confirmation notice from Payroll concerning a change in my AT&T 401K allotment package. The notice was printed on a small card, addressed to me. Why can't private information such as this be sent in an envelope rather than exposed for all the world to see? I would hope that Payroll's employees would not be too over-worked if they were to make some effort to keep private employee information out of public view.

A: Officially, Personnel Information Systems Div. 3532 does not consider savings plan allotment percentages to be private information. However, I can understand that such information may be considered sensitive by some employees and is probably more appropriately kept from public view.

This requires Payroll employees to insert all such notifications into individual envelopes before mailing. We began this new procedure with August's notifications and will evaluate its cost-effectiveness after a few months.

Paul Stanford (100)

Q: Now that Sandia is striving for ES&H excellence, we still have a lot of cyclists who choose to violate the published rules for bicycles. Often, when I am outdoors in Area I, I see cyclists riding on the malls or sidewalks and failing to stop at stop signs. Some ride fast, especially when coming to work or going home. These issues are defined in the following places: ES&H Employee's Handbook, pg. 22; ES&H Bulletin No. 38, July 1989; Weekly Bulletin, Jan. 28, 1991; Weekly Bulletin, April 8, 1991; and the malls are posted with signs.

Did the Tiger Team report cyclist violations? What can be done to convince cyclists that the "Code of Conduct" requires them and all Sandians to follow established rules?

A: Traffic rules pertaining to safe and lawful operation of bicycles have been widely published among employees. Enforcement is handled by Security. Supervisors can help promote bicycle safety through their own safety briefings and the administration of discipline when an employee receives a traffic citation. Violators may be reported to Security on 4-3155. Traffic safety is everyone's responsibility.

Jim Martin (3400)

Q: Daily cleaning of floors, desks, trash cans, and rest rooms is done by janitorial staff. Is there any provision for cleaning done less often, such as dusting the tops of space savers and partitions, cleaning heating and cooling registers, or cleaning doors and window ledges? The accumulation of dust and dirt can be a hazard to health and equipment.

A: Custodial employees are mainly responsible on a daily basis for removing trash and cleaning rest rooms. Over the years, increased square footage has added to the area of responsibility, while the number of custodians has remained constant. This limits our ability to perform additional services.

However, additional custodial services are available within daily work assignments as scheduling or staffing requirements permit. You may discuss special concerns or problems with any of the custodians or the lead person in your area. In the absence of a response, you may call the Division 3426 supervisor on 4-4146. Usually, a word or two with custodians in your area will resolve most cleaning problems. We will certainly attempt to meet your needs as soon as possible. Thank you for your concern and for bringing this matter to our attention.

Jim Martin (3400)

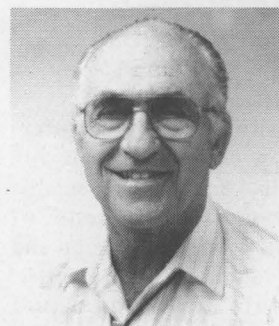
Q: A near-collision with a bunch of bicyclists has brought to my attention the danger in the parking lot near the Personnel/Medical buildings. One of the streets headed south toward the lot leads directly into a one-way, "exit-only" driveway that conveniently leads to Gate 4. Recently, as I was turning out of the parking lot, the cyclists crossed F Street from the opposite side and headed right toward me. I could do nothing but stop completely and wait until they passed. They were all around me making faces as they passed. I'm sure they know they were going the wrong way but don't care. Why aren't they being stopped?

A: After investigating the situation at the intersection of Seventh and F streets, the Traffic Liaison Committee is promoting the items listed below in an effort to solve the problems resulting from the interaction between pedestrians, bicyclists, and motor vehicles. The first three items can be added immediately; the fourth must wait until funding is available.

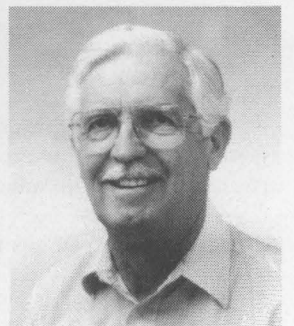
- Paint a crosswalk on the west side of the intersection across F Street.
- Paint a bicycle lane from F Street to Gate 4.
- Increase the sensitivity of the loop detector system.
- Install a pedestrian actuator button system.

Jim Martin (3400)

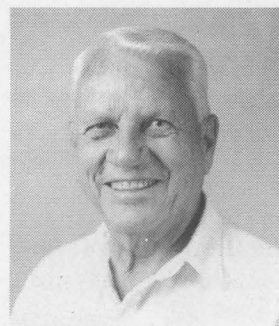
Recent Retirees



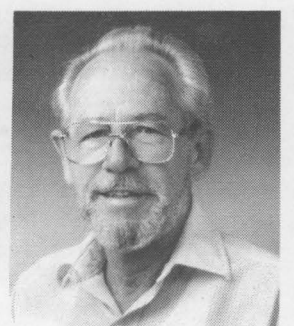
Wayne Trump
3443 27



Cal Cox
2715 42



Bob Martin
2716 34



Leon Gordon
7815 15

Sympathy

To Ermelindo Marquez (7818) on the death of his sister in Belen, Aug. 25.

To Kay Nordeen (3421) on the death of her father in Des Moines, Iowa, Sept. 3.

To Betty Street (1942) on the death of her sister in Albuquerque, Sept. 7.



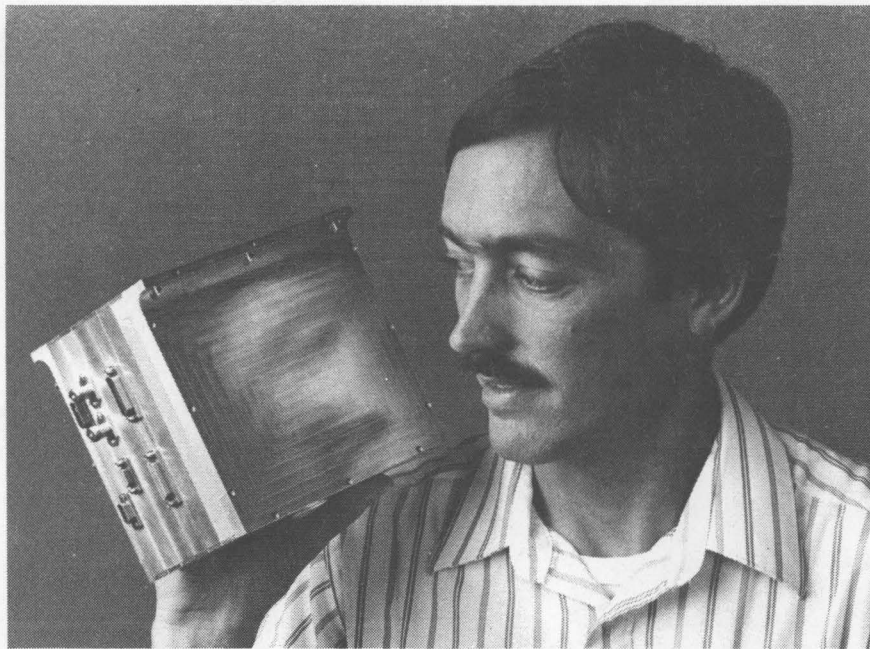
DONATING their time and talents, James del Coriz (2755) and Bonnie Skenandore (3155) recently raised \$800 to benefit the American Indian Science and Engineering Society's pre-college fund. Bonnie has made drums for four years as a hobby, and James has made and sold necklaces and other jewelry for 17 years. Both items were raffled off during a recent Sandia American Indian Outreach Committee fundraiser. The pre-college fund supports college scholarships for American Indian students.

Recent Patents To Sandians

Phil Fuerschbach (1831), Jim Jellison, Dave Keicher (both 1833), and Bill Oberkamp (1556): Method and Device for Controlling Plume During Laser Welding.

Ron Hadley, John Hohimer (both 1164), and Del Owyong (1160): Integrated Injection-Locked Semiconductor Diode Laser.

Bob Blewer (2132), Terry Guilinger (1841), Mike Kelly (1824), and Sylvia Tsao (former Sandian): Formation of Multiple Levels of Porous Silicon for Buried Insulators and Conductors in Silicon Device Technologies.



SANDIA ELECTRICAL engineer Glenn Russell (2336) displays the latest version of SANDAC V, a state-of-the-art, rugged, miniaturized parallel-processing computer that runs on batteries and provides super-computerlike performance for special airborne projects. It is also expandable; this is a six-module configuration. Sandia and defense agencies use it in a variety of projects including robotics, image recognition, and testing of various proof-of-principle exploratory systems.

Sandia News Briefs

Seyfer Named to Board of Governors

Char Seyfer (3522) was recently appointed to serve a four-year stint as a member of the Board of Governors of the American Society for Training and Development (ASTD).

As in-hours technical education coordinator for Sandia, Char oversees technical education programs for engineers, physicists, and other technical staff members.

Char worked for a part of the Bell System (now US West Communications) before coming to Sandia. While at Bell, she was responsible for creating and marketing a computer software system for instructional designers. She has also served as president of the International Board of Standards for Training, Performance, and Instruction, and published an article titled "The Instructional Design Competencies."

The Board of Governors' role is to evaluate trends in training and development and recommend ways for ASTD to improve human resource development.

Sandia Gets Kudos from Small Business Administration

Sandia received the highest rating possible from the US Small Business Administration (SBA) recently for the Labs' subcontracting policies regarding small and small disadvantaged businesses.

The rating of "excellent" was awarded to Sandia based on an in-depth review of the Labs' subcontracting program conducted in March. The review, conducted jointly by SBA and DOE, is required by federal law. Its purpose is to ensure that small and small disadvantaged businesses are given every practicable opportunity to participate in contractual agreements with federal agencies.

Several Sandians contributed during the review, including Jon Bedingfield, Daniel Naru, Connie Wenk (all Supplier Relations Div. 3703), and Purchasing Director Bob Zaeh (3700). "We're quite proud of this rating and Sandia's ability to work with hundreds of small business suppliers," says Jon.

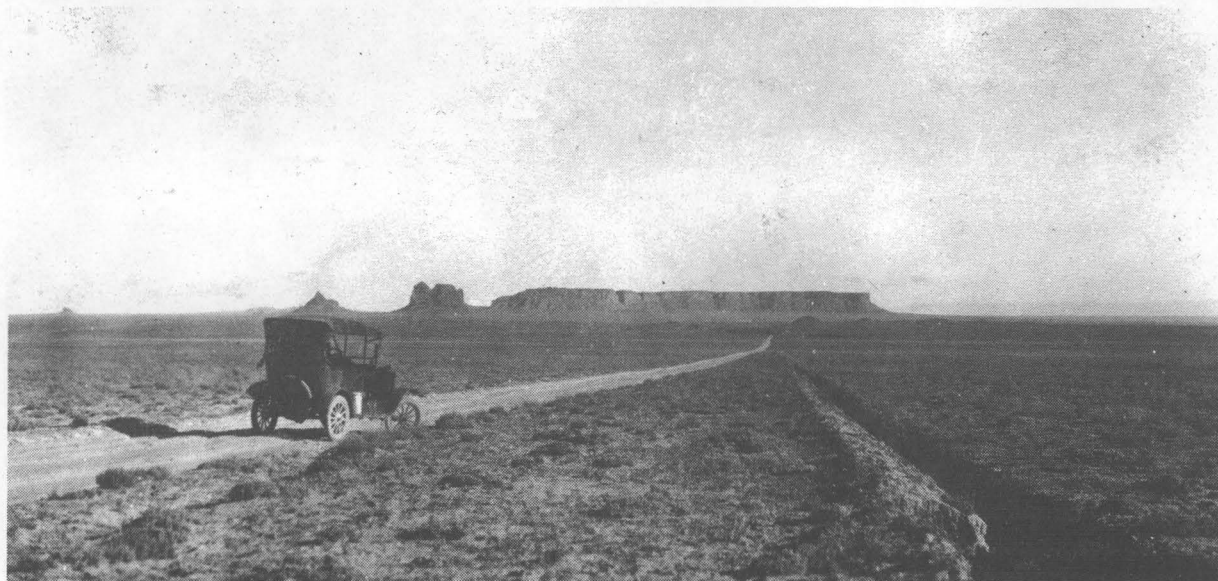
DOE Signs Tech Transfer Pact

An agreement formally encouraging the transfer of unclassified technology from DOE defense labs to private industry was signed recently by DOE and the National Center for Manufacturing Sciences (NCMS).

The Memorandum of Understanding supports DOE's efforts to make its technology base available to the private sector to enhance American competitiveness. According to Deputy Secretary Henson Moore, who signed the agreement, it opens up to a greater degree than ever before DOE's three defense national laboratories — Sandia, Los Alamos, and Lawrence Livermore — to the mission of technology transfer.

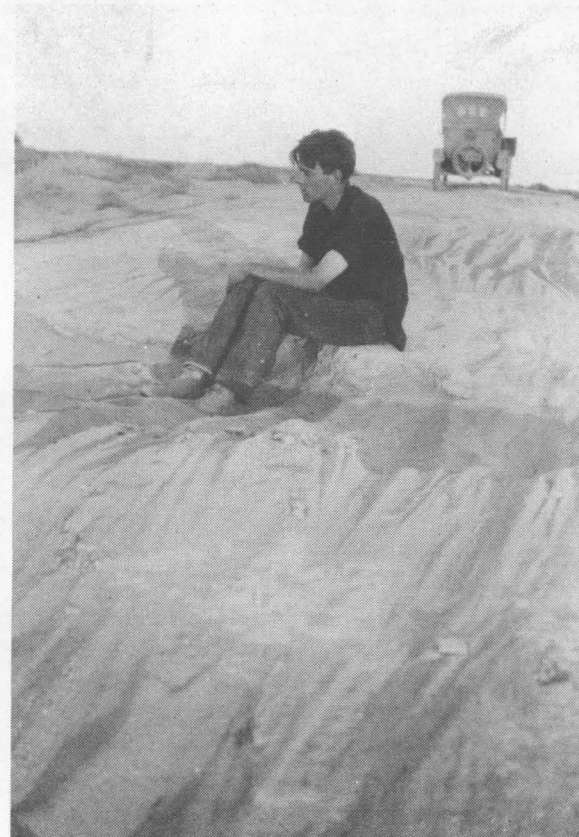
Signing the agreement for NCMS was President Edward Miller. NCMS is a consortium of more than 125 manufacturers committed to making US manufacturing globally competitive.

Favorite Old Photos



RETURNING TO OJAI, Calif., from Yale in the summer of 1924, my father, George Thacher (seen here, then 21 years old), took photos while traversing the New Mexico desert in a Model T touring car. The roads weren't too good then; the pavement along old Route 66 ended in St. Louis and began again in Victorville, Calif. Dad and his companion took a detour to what is now Mesa Verde National Park, Colo. Both photos were taken on a road somewhere between Mesa Verde and Gallup.

— Phil Thacher (4341)



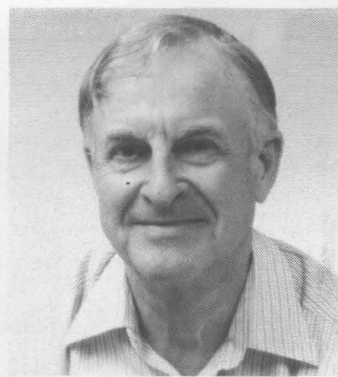
MILEPOSTS

LAB NEWS

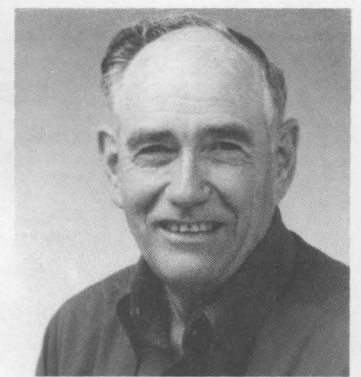
September 1991



Ollie Davis
7821 25



Donald Sharp
1841 20



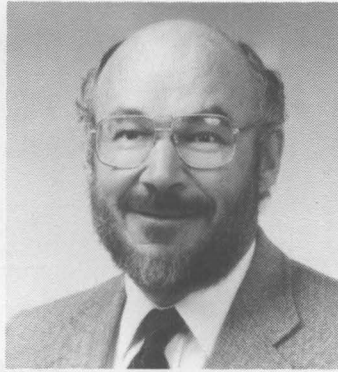
Leland Allen
5113 35



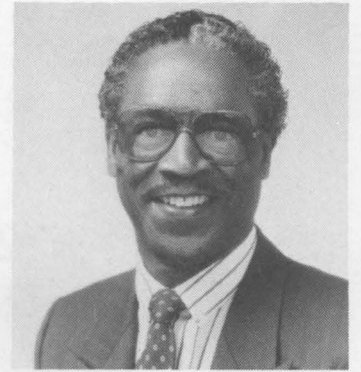
John Strascina
2471 25



Brien Bopp
5513 25



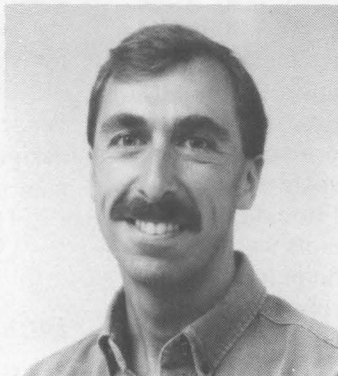
E. E. "Tex" Ritterbush
111 30



Hugh Jones
3726 20



Larry Bertholf
4400 25



David Hannum
9548 15



Kenyon Nowotny
1944 30



Herb Pitts
3100 30



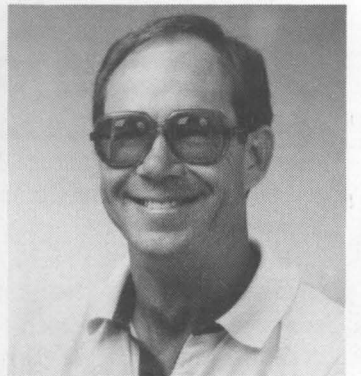
Johnnie Griego
9231 15



Al Skinrood
5366 35



Paul Hommert
6250 15



Charles Warren
2541 20



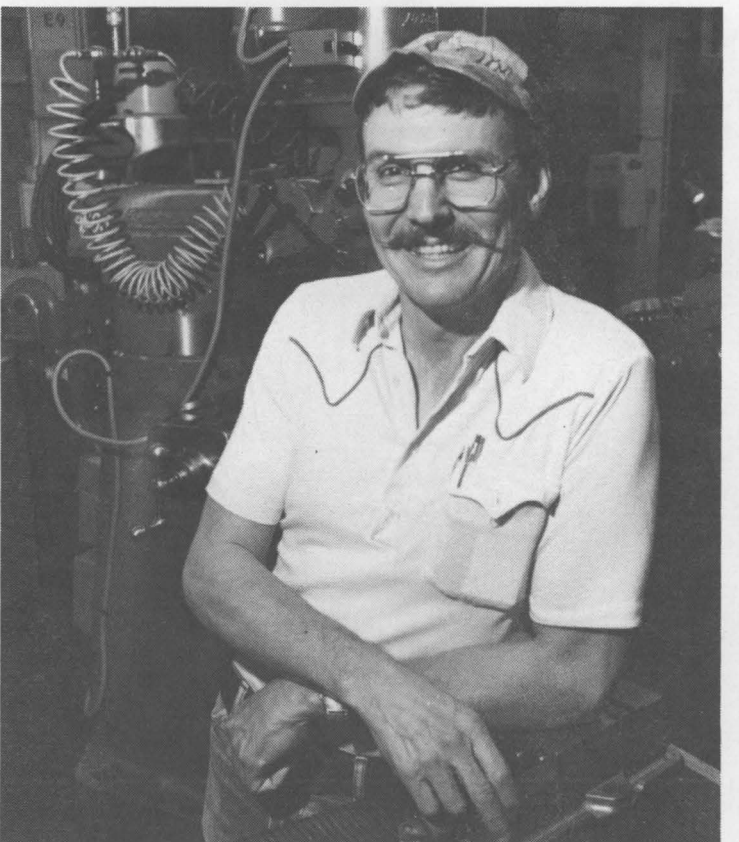
William Lutgen
2853 35



Olivia Harris
152 15



Bob Anderson
1815 20



Keith Mote
2481 25



Bob Eagan
1800 20



Bob Pilkey
8275 15



Marvin Bauder
2722 35

UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS • UNCLASSIFIED ADVERTISEMENTS

Deadline: Friday noon before week of publication unless changed by holiday. Mail to Div. 3162.

Ad Rules

- Limit 20 words, including last name and home phone.
- Include organization and full name with each ad submission.
- Submit each ad in writing. No phone-ins.
- Use 8 1/2 by 11-inch paper.
- Use separate sheet for each ad category.
- Type or print ads legibly; use only accepted abbreviations.
- One ad per category per issue.
- No more than two insertions of same "for sale" or "wanted" item.
- No "For Rent" ads except for employees on temporary assignment.
- No commercial ads.
- For active and retired Sandians and DOE employees.
- Housing listed for sale is available for occupancy without regard to race, creed, color, or national origin.
- "Work Wanted" ads limited to student-aged children of employees.

MISCELLANEOUS

KING-SIZE WATERBED, waveless, headboard, padded rails, sheets, pad, \$100 OBO. Hueller, 296-0976.
 CASSETTE DECKS: 1 Teac, \$75 OBO; 1 Onkyo, \$110 OBO. McCord, 281-2146.
 SHERRILL SOFA, w/2 matching pillows, off-white, 72-in., \$450 OBO. Adams, 823-1845.
 BACK SLIDING WINDOW for '84 to '88 Toyota truck; several back windows for Datsun trucks. Chavez, 842-6374.
 VALMET ASSAULT RIFLE, Model 76, .223-cal., night sights, sling, recoil pad, extra mags, \$690. Johnson, 898-8439.
 WHEELS (4), fit '81 Toyota pickup, 5-hole, 14x6, \$38. Harding, 291-9449.
 SEWING MACHINE, in solid-wood cabinet, Sears Kenmore, \$75. Heald, 281-8826.
 MALE AKITA, 7 yrs. old; female Akita, 5 yrs. old; free. Rael, 884-4778.
 FORMICA-TOP TABLE, \$25; black metal desk, woodgrain top, \$75; gun cabinet, \$75; wood-framed mirror, \$30. Oglesby, 296-5361.
 COMPLETE DARKROOM: Omega D-2, timers, 3 lenses, chemicals, paper, trays, more, \$1,200. Ripple, 293-9326.
 PRINTERS: Epson RX80 dot-matrix, \$95; Smith-Corona daisy-wheel, \$70; 64K printer buffer, \$45. Barham, 298-7304.
 KENMORE GAS STOVE, 30-in., electric burner start, digital clock timer readings, green color, \$150. Martinez, 831-0876.
 MISC. SHOP TOOLS, pair speaker enclosures, 2 pair 12-in. drivers. Granfield, 268-1942.
 WASHER, Montgomery Ward, large capacity, heavy-duty, almond, \$125. Santana, 294-0536.
 VACATION in luxury studio condo on the beach in Puerto Vallarta, Mexico. Shepherd, 296-1238.
 STARCRAFT POP-UP TRAILER, sleeps 6, electric water pump, carpet available, \$1,200 OBO. Tripp, 822-8580.
 ANTIQUE WALNUT DINING ROOM CHAIRS, set of 4, seats need re-caning, \$150; Yamaha guitar, w/case, \$150. Kinney, 823-1246.
 DRAFTING TABLE, engineering office type, w/tilting top, flat-file drawer, side (accessories) drawer, \$250. Arellanes, 292-0041.
 LUDWIG SNARE DRUM & CASE, \$80; Norma 5-piece drum set, many extra pieces, \$175. Dickason, 299-8125.

ROLLUP GARAGE DOOR, 9x7, \$60; Rollicord camera, w/flash, \$35; theater-type organ, Leslie, full pedals, \$895. Minnear, 281-0946.
 AVITA 350 ELECTRIC TREADMILL, 1-1/2-hp motor, 0-10 mph, 61" x 21" x 51", sells for \$1,200, asking \$750. Duffy, 275-2857.
 AUTO PARTS: Triumph TR-7 body/chassis parts, Chev. aluminum 2-bbl. manifold, \$35; Monte Carlo/Chevelle radiator, \$40. Silva, 265-5523.
 CHIHUAHUA PUPPIES, AKC-registered, males, long & smoothcoats, champion backgrounds, first shots, wormed, written guarantee, one pocket-sized, \$200-\$250. Sargent, 865-3227.
 KENMORE PORTABLE DISH-WASHER, \$100; microwave cabinet, 29" wide, 20" deep, 72" high, \$75; Tappan microwave, \$75. Foucher, 883-8638.
 FIVE-FAMILY SALE, 14100 block of Grand NE, Sept. 28-29, 9 a.m.-4 p.m., stereo, baby furniture/clothes, waterbed, bar stools, more. Reno, 296-6290.
 ANSWERING MACHINE, 4-1/2-in. Tasco telescope, factory manuals for '89 Buick LeSabre/Park Avenue, VTVM, signal generator, signal tracer. Scheiber, 298-0904.
 EXECUTIVE DESK, L-shaped, 2-level, 5-drawer, w/chair, walnut finish, \$195. Miller, 268-5992.
 YAMAHA TRUMPET, w/case, Model YTR2320, retail \$510, asking \$300 OBO. Ledwith, 821-9154.
 LITTON RANGE, w/overhead microwave, gold, \$200; Vito clarinet, w/case & stand, \$115. Weinbrecht, 821-8892.
 BOX SEATS, Oakland A's & Rangers games in Texas, Oct. 5-6, 1 pair for each game. Hernandez, 268-2133.
 REMINGTON .22-250, w/scope; Colt 10mm; Colt Mustang, .380; Ruger .357; Winchester 1200 20-ga. Buttz, 822-1448.
 ROTOTILLER, Sears, 8-hp, \$150. Kelly, 293-2475.
 POWER CASTER, moves your trailer in and out of tight spaces easily, \$150. Fisher, 298-0526.
 NORFOLK PINE HOUSEPLANT, healthy, 8-ft., \$80; 63-in. couch, 2-cushion, brown/gold plaid, some wear, \$75. Scheibner, 345-9351.
 ALTO SAXOPHONE, w/case, \$475 OBO. Smith, 821-0024.
 KENMORE REFRIGERATOR, 24-cu.-ft., white, frost-free, icemaker, used 5 mos., 1-year service contract, \$600 OBO. Hunt, 275-9608.
 COUCH, \$150; 2 high-back chairs, \$100/ea.; coffee table, \$100; 2 end tables, \$75/ea.; free-standing fireplace, \$250. Painter, 292-1742.
 ANTIQUES: 9-drawer wood desk, \$400; green porcelain gas stove, \$350; Duncan Phyfe curio, \$300; cedar chest, \$250. Sisneros, 839-0058.
 COMBINATION HEARTH & FREE-STANDING STOVE, Garrison VII, double-glass doors plus screen, heats 1,500 sq. ft., \$350. Alexander, 299-4866.
 CAMPER SHELL, Brahma, black, LWB, \$300. Liguori, 256-3613.
 BABY ITEMS: Graco playpen, Graco walker, boy's clothing, infant to 18 mos. Altherr, 881-6987.
 SLIDE TRAYS, w/commercially made slides of Rome, Florence, Berlin, Venice, Chicago, others; onyx chess set & board, 14" x 14". Wagner, 823-9323.
 WOODSTOVE, free-standing, w/screen & stack, \$130 OBO. Spears, 266-9782.
 BEER BOTTLE COLLECTION, approx. 120 brands, selling as whole collection, domestic & imports, \$30. Holmes, 292-0898.
 ONE-WAY AIRLINE TICKET, to Seattle, best offer. Carli, 298-9271.

NORITAKE FINE BONE CHINA, 64-piece service for 8, white w/white flower pattern, platinum trim, \$225 OBO. Barnard, 831-4114.
 FLEA MARKET & BAKE SALE, aluminum collection, Sept. 28, 7 a.m.-2 p.m., Central & Juan Tabo, spaces available, sponsored by Manzano Band Boosters. Pucket, 298-6067.
 SOFA-SLEEPER, 5 yrs. old, \$250. Meeks, 828-9825.
 SUPER-8 MOVIE PROJECTOR, Bell & Howell. Simon, 299-8468 evenings.
 IBM COMPUTER, 80287 math chip, \$50; Powerflex rowing machine, \$50. Kimberly, 293-5835.
 CANON AE-1 PROGRAM CAMERA, power winder, 50mm F1-8 lens, \$250; Sony CD player, \$150. Bowland, 256-1861.
 EMERSON MICROWAVE OVEN, 0.4 cu. ft., 10" x 18" x 12", \$45; Avanti refrigerator, 1.7 cu. ft., 17" x 21", walnut, \$35. Ashby, 296-8330.
 QUEEN-SIZE FUTON, \$50. Hunter, 294-2877.
 ROLLTOP DESK, \$75; La-Z-Boy executive chair, \$125; woman's new down ski jacket, small, \$30; Panasonic printer, \$70. Gillen, 298-2282.
 KING-SIZE WATERBED, w/bookcase headboard, 2 sets of sheets, 2 king-size pillows, & comforter, \$125. Compton, 842-1569.
 TRUNDLE BED, metal frame, no mattress, \$100; Sony reel-to-reel tape recorder, \$45; TI Silent-700 terminal, best offer. Geitgey, 821-5827.
 YARD SALE: 3-family, Sept. 27 & 28, 9 a.m.-6 p.m., microwave oven, refrigerator, baby items, typewriter, more, 10425 Aspen NE. Morris, 292-1722.
 QUEEN-SIZE BEDROOM SET: headboard, mattress, box spring, dresser w/double mirrors, armoire, \$400. Henfling, 292-0794.
 TELESCOPE EYEPIECES, 1.25-in. orthoscopic design, 12.5mm University Optics, 7mm Meade Research Series, \$40/ea. or \$75/both. Lynch, 292-8523.
 LEER FIBERGLASS SHELL for full-size Ford pickup, sliding side windows w/screens, interior light, pass-through window, \$350 OBO. Zaorski, 281-9194.
 ROCKMAN SUSTAINER GUITAR PREAMP, w/foot switch, \$150 OBO; Ibanez multi-mode analog delay, \$75 OBO; Aphex (Type C) aural exciter, \$150 OBO. Hood, 291-9310.
 BABY STROLLER, \$30; playpen, \$25; infant car seat, \$15; toddler car seat, \$25. Van Deusen, 291-8196 after 5 p.m.
 TWO TIRES, 15K miles tread left, P225/75R14, 2-ply steel radial, white sidewall, cost \$60, sell for \$10/ea. Stamm, 255-2640.
 TIKES TURTLE SANDBOX, \$30; train, \$10; play slide, \$15; Fisher-Price mobile, \$11; rocking dog, \$11; lawn mower, \$6. Korbin, 821-8461.
 WINTER COVER FOR SWIMMING POOL, fits up to 16' x 35' pool, \$30; bathroom sink, \$5; skis, \$25. Mozley, 884-3453.
 GARAGE SALE: Sat. & Sun., Sept. 21 & 22, 10605 Walker NE, washer/dryer, dinette, microwave, lawn mower, bikes, misc. Spears, 293-2412.
 HEAT PIPE, passive/freon solar water heater, 82-gal. large model, \$750; lawn mowers, electric/gasoline, \$10/ea. Ukena, 275-7275.
 AST PREMIUM 286 COMPUTER, 2M RAM, 43M hard disk, software, \$925 OBO; 2 season tickets for NM Symphony, \$100/ea. Prueett, 293-6244.
 WHEEL RIMS for Chrysler Le Baron, \$25 for 2. Kestenbaum, 296-5056.

SAILBOARDS, Bic slalom, \$225 OBO; Velocity Custom, \$75 OBO; downhill ski boots, \$5. Johnson, 292-0163.
 LEADING EDGE COMPUTER, Model "D", 100% XT-compatible, monochrome monitor, 30M HD, 5.25 DS/DD floppy, software, \$300. Patteson, 836-0140.

TRANSPORTATION

MAN'S BIKE, 3-spd. Huff; girl's Columbia banana-seat bike. Simon, 299-8468.
 '89 FORD PROBE LX ESP, 6-yr./60K-mile warranty, AT, AC, loaded, 25K miles, original owner, \$9,000. Ulibarri, 293-1974.
 '86 FORD F-150 XLT PICKUP, one owner, 73K miles, loaded, w/camper shell, \$6,195. Ferguson, 292-3824.
 '89 MAZDA TRUCK, AC, PS, PB, AM/FM radio, w/matching shell, \$7,200 firm. Torres, 281-8372.
 '84 CAMARO, AC, T-tops, one owner, \$3,000 OBO. McWhorter, 822-1626.
 '89 COBRA 1804 BASS BOAT, stainless prop, Bottomline 310XT fish-finder, Force 125-hp, \$8,950. Ripple, 293-9326.
 '79 SUZUKI GS850, Windjammer, electric start, DOHC, high-back seat, \$800 OBO. Barham, 275-8257.
 '85-1/2 MERCURY LYNX, AC, AT, rear-end damage, 48K miles, \$1,450 OBO. Johnson, 296-1917.
 '80 SUZUKI GS1000G, shaft drive, fully loaded. Potter, 869-4716.
 '88 TOYOTA CAMRY SEDAN, 4-dr., Luxury Edition, All-Trac, 28K miles, \$11,000. Barr, 822-0671.
 24-FT. MOTORHOME, '76 Brougham, 318 V-8 engine, Dodge chassis, 48K miles, all options, second owner, records, \$8,200 OBO. Sparks, 884-7376.
 '89 KAWASAKI KX-125, \$1,650 OBO. Witkowski, 299-6402.
 '82 KAWASAKI 1100 SPECTRE, garaged, \$990. Conrad, 294-2807.
 '81 OLDS TORONADO, AT, PS, PB, cruise, tilt, PW, AC, AM/FM, white, beige interior, \$2,700. Dabbs, 281-4686.
 '77 TOYOTA LANDCRUISER, 6-cyl., auxiliary fuel tank, hardtop, soft-top, 33-in. tires, black spoke rims, \$2,300 OBO. Barnard, 831-4114.
 WOMAN'S 3-SPD. BIKE, \$40. Meeks, 828-9825.
 '76 DATSUN KING-CAB 620 PICKUP, AT, deluxe cab, radio, toolbox, bucket seats, one owner, \$850. Ashby, 296-8330.
 GIRL'S 16-IN. BICYCLE, girl's scooter, \$30/ea. Miller, 275-1609.
 '71 HONDA CB350 MOTORCYCLE, black w/chrome, 15K miles; Ford tractor, 9N w/blade, \$1,500. Bush, 281-3773.
 MAN'S SCHWINN TRAVELER, 12-spd., 23-in. frame, paid \$250, asking \$150. Kureczko, 281-8206.
 '84 HONDA 650 Nighthawk, Kiwi helmet, removable luggage rack, passenger back rest. Miner, 275-0689 evenings.
 '89 KAWASAKI KLR650 ENDURO MOTORCYCLE, \$2,200 OBO. Hughes, 883-8784.
 '76 JEEP CHEROKEE, 115K miles, 6-cyl., 3-spd., AC, PS, 4-WD, trailer hitch & brakes, \$2,800. Van Deusen, 291-8196 after 5 p.m.
 UNIVEGA ALPINA PRO MOUNTAIN BIKE, new, 19-in., Shimano Deore DX components, Ritchey rims & tires, \$500. Matzen, 294-8734.
 KAWASAKI 200cc STREET MOTORCYCLE, luggage rack, windshield, helmets, 9,800 miles, \$325 or trade for gun. Bendure, 298-4763.
 '86 FORD MUSTANG LX, 2-dr., 4-cyl., 4-spd., 85K miles, one owner, needs paint, \$2,400. Perry, 899-0228.

'80 BUICK SKYLARK, 4-cyl., manual, FWD, PS, PB, \$2,000. Puccini, 821-3171 or 255-0568.
 '89 DODGE DAKOTA PICKUP, loaded, new tires, need cash for college, \$1,350 below book, \$6,000 firm. McNeill, 293-1234.
 SCHWINN 10-SPD. BICYCLE, 24-in., \$75. Kestenbaum, 296-5056.

REAL ESTATE

4-BDR. HOME, 1-3/4 baths, den w/fireplace, large game/leisure room, 1013 Georgia SE, \$82,500. Miller, 268-5992.
 CONDO, bedroom, den, living room, dining area, all conveniences, refrigerated air, access to laundry, swimming pool. Stuart, 345-6358.
 2-BDR. MOBILE HOME, double-wide, 2 baths, sun porch, carport, storm windows, 24' x 53', Four Hills, \$24,500. Richardson, 293-4219.
 1/2 ACRE, Bosque Farms, w/2-bdr. mobile home, well & city water, \$4,000 down plus terms, \$38,000. Montoya, 842-0929.
 3-BDR. MOBILE HOME, 16' x 80', w/8' x 25' addition, Four Hills Mobile Home Park, fenced for dog, extras. Langlois, 293-3097.
 PATIO HOME, corner lot, east of Tramway off Lomas, near open space, w/views, \$49,500. Halbleib, 268-6571.
 LAND, South 14, approx 2.5 acres, good water area, power & phones, on cul-de-sac, \$22,000. Witkowski, 299-6402.
 4-BDR. HOME, Prospector's Ridge, basement, alarm system, extras, assumable, \$129,900. Beeson, 294-6259.
 4-BDR. HOME, LR, den w/fireplace, sprinklers, new paint, roof, cooler, NE of Eubank/Comanche, terms available. Cashwell, 275-0708.
 3-BDR. HOME, Heritage Hills, great room, fruit trees, large vegetable garden area, assumable VA mortgage, La Cueva & Dennis Chavez district. Montoya, 822-0717.

WANTED

OUTBOARD MOTOR, 80-hp or more, for 18-ft. boat. Chavez, 842-6374 after 6 p.m. or weekends.
 HOUSEMATE, to share 3-bdr. home in NE Heights, 2 baths, 2-car garage, non-smoker, \$350/mo. & half utilities. Caponera, 883-3851.
 STEPPING STONES, concrete "moonwalks," 3/4-moon shape. Lehrer, 898-2581.
 SWAMP-COOLER MOTOR, 1/2-hp, 2-spd. Moss, 298-2643.
 LITTLE TYKES TABLE & CHAIR SET, playground w/slide, good condition. Kimberly, 293-5835.
 COLOR MONITOR, for Apple IIe computer. Torres, 293-4385.
 HONDA REFLEX, '85/'86, will purchase or trade '82 Yamaha XT200 w/1,449 miles. Roth, 344-7060.
 STATIONARY EXERCYCLE. Miller, 822-0008.

SHARE-A-RIDE

CORRALES & RIO RANCHO VAN-POOL, has openings for full-time & part-time riders, offering 2 weeks free to new riders. Durand, 263-1412 or 4-RIDE.
 CEDAR CREST VANPOOL, \$35/mo., Frost Rd., N-14, Tijeras. Yelton (281-2893) or Burns (281-3922).
 BELEN COMMUTER seeks non-smoker carpool or vanpool to Tech Area 1, prefer driver-rotation carpool. Kercheval, 864-6549.

Coronado Club Activities

Singles Mingle Tonight, Isleta Poor Boys Next Week

SINGLES MINGLING at tonight's Open House can savor a low-cost buffet, enjoy the variety music of "Sonny & Co.," play volleyball/pingpong/etc., and — last but not least — start organizing Sandia singles to become a regular C-Club group. Everybody will get a questionnaire to spark ideas for future activities, from darts to dancing. Buffet served 5-7, music 6-10.

POOR BOYS AND PRIME RIB — Isleta Poor Boys on stage, that is, and prime rib on your plate. If you prefer grilled halibut, it's "two-for" priced the same as the rib, at \$16.95. Other luscious choices, too. Dinner will be served 6-9, music 7-11. All this is next Friday, Sept. 27; reservations recommended.

MONDAY, FUNDAY — Monday Night Football has come back to the big-screen TV. Stop by the lounge for a drawing ticket and maybe you'll win the monthly NFL jacket. Even if you don't, you'll be a winner when you enjoy the munchies and drink specials. It's the NY Jets at Chicago on the 23rd, Philadelphia at Washington on the 30th.

BUFFET AND BINGO every Thursday evening: buffet starting at 5:30, early-bird bingo special at 6:45, and that's only the beginning. Special note for boys & girls & moms & dads — Kids' Bingo this month is Sunday, Sept. 29, with a backpack of goodies going to some lucky youngster. Bingo starts at 1 p.m.; low-cost buffet served starting at noon.

Congratulations

- To Kristi and Brian (7713) Thomson, a son, Chase Montgomery, July 15.
- To Linda and Steve (1513) Kempka, a daughter, Laura Elisse, Aug. 21.
- To Darcy and Paul (9567) Klarer, a son, Kristopher Steven, Aug. 23.
- To Jennifer and David (1555) Outka, a son, Ryan Christopher, Aug. 26.
- To Vicki (7723) and Ernest Gutierrez, a daughter, Jessica, Aug. 26.
- To Pat (2831) and Jim (3121) Tempel, a son, Derek Jaymes, July 7.
- To Lisa Wiley (2853) and Christopher Welcher (2858), married in Canal Fulton, Ohio, Aug. 17.
- To Lisa and Mark (2858) Platzbecker, a son, Brian Robert, Aug. 23.
- To Gail (1275) and Ron (2341) Simon, a daughter, Sarah Michelle, Sept. 4.

Events Calendar

Events Calendar items are gathered from various sources. Readers should confirm times and dates of interest whenever possible.

Sept. 20 — Night Under the Stars: an evening for families to enjoy Indian legends and stories, dances, food, & more; 6:30-9 p.m., Indian Pueblo Cultural Center, 843-7270.

Sept. 20-21 — Classics Series: New Mexico Symphony Orchestra performs Stravinsky's "Fireworks, Opus 4," Corigliano's "Pied Piper Fantasy," and Mahler's "Symphony No. 1 in D Major"; 8:15 p.m., Popejoy Hall, 842-8565.

Sept. 20-21 — The Marketplace Fall Arts and Crafts Show, works by more than 70 local crafters; 9 a.m.-5 p.m., Wyoming Mall, 294-1606 or 296-0460.

Sept. 20-28 — "One Flew Over the Cuckoo's Nest," by Dale Wasserman from the novel by Ken Kesey; 8 p.m. Thurs.-Sat., 2 p.m. Sun.; Albuquerque Little Theatre, 242-4750.

Sept. 20-Oct. 4 — Exhibit: "Henry Nadler 1930-1990, A Retrospective"; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; UNM Art Museum, 277-4001.

Sept. 20-Oct. 6 — Exhibit, "Contours of an Unknown Land: Photographs of Clarence John Laughlin 1946-1955"; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., 1-4 p.m. Sun.; (gallery talk Sept. 17 by Carol McCusker, master's degree candidate in UNM's Department of Art and Art History), Study Gallery, UNM Art Museum, 277-4001.

Sept. 20-Oct. 12 — "Graceland," and "Asleep on the Wind," one-act plays follow "Rootie" from her parting with her best friend and fellow Elvis fan as he prepares to escape the poverty of the deep South by signing up for the army — and Vietnam; to a time ten years later as she is camped out on the grounds of Graceland, home of the king himself, presented by Theatre-in-the-Making; 8 p.m. Fri. & Sat., CenterStage, 260-0331.

Sept. 20-Oct. 13 — "And They Dance Real Slow in Jackson," by Jim Leonard, polio victim Elizabeth Ann Willow lives quietly with her parents in rural Indiana, a mosaic of haunting memories and taunting realities that give way to gaunt illusions; 8 p.m. Fri. & Sat., 6 p.m. Sun.; Vortex Theatre, 247-8600.

Sept. 20-Nov. 1 — Exhibit, "Aesthetically Correct/Aesthetically Incorrect," images chart how artistic trends have changed over the last 60 years, copies of manifestos, critical writings, and artists' commentaries accompany each image; 9 a.m.-4 p.m. Tues.-Fri., 5-9 p.m. Tues., closed Mon. & weekends; UNM Jonson Gallery, 277-4967.

Sept. 20-Dec. 1 — Exhibit, "Awards in the Visual Arts 10," 25 works of art by 10 artists from throughout the United States, sponsored by the Southeastern Center for Contemporary Art in Winston-Salem, N.C.; 9 a.m.-5 p.m. Tues.-Sun., Albuquerque Museum of Art, History, and Science, 243-7255.

Sept. 20-Feb. 9 — Exhibit, "Horse Tales: An Evolutionary Odyssey," produced by the Natural History Museum in a collaborative program with the Hubbard Museum of the Horse in Ruidoso Downs, tells about the horse from its first appearance in North America to its reintroduction by the Spanish to its modern-day place in the natural world; 9 a.m.-5 p.m., New Mexico Museum of Natural History and Science, 841-8837.

Sept. 25 — Centennial Speakers' Series: an

Evening with William de Buys, author of *River of Traps* (UNM Press, 1990), a story about Jacobo Romero, the simple wise man of El Valle, NM, who inspired de Buys' book, UNM Homecoming event; 7:30 p.m., Woodward Hall, 272-5626.

Sept. 25 — St. Elizabeth Feast Day: harvest and social dances, call for time, Laguna Pueblo, 843-7270.

Sept. 27 — UNM Homecoming Event: "Friday Night Fling," hot-air balloon glow, free food & drinks, music, entertainment, annual Homecoming Campus Decoration Tour; 6:30 p.m., Johnson Field, 272-LOBO.

Sept. 27 — Shields and Yarnell, comedic mime duo; 8 p.m., KiMo Theatre, 764-1700.

Sept. 27-29 — Oktoberfest '91: German music, dancing, entertainment, and food; noon to midnight Fri. & Sat., noon to 10 p.m. Sun.; Haynes Park (Hwy. 528 across from Intel), Rio Rancho.

Sept. 28 — Spicy Latin Dance Showcase, presented by UNM Division of Continuing Education and Baila! Baila! International Dance Studios, featuring Baila! Baila! adult and youth Ballet Folklorico dance teams and adult Latin dance group, spotlighting dances of Mexico and Latin America, special guest appearance by Mariachi Nuevo Tapatío; 7 p.m., UNM Continuing Education Center (University & Indian School), 265-1858.

Sept. 28 — Exhibit opening, "Sagebrush Ocean," exhibit celebrates — in the words and photographs of Salt Lake City author/photographer Stephen Trimble —

the sagebrush seas, island mountains, and dry lakes that comprise the Great Basin area of Nevada, Utah, Oregon, Idaho, and California (runs through Jan. 9); 9 a.m.-5 p.m., New Mexico Museum of Natural History and Science, 841-8837.

Sept. 28 — Endangered Species Fair, provides information about what you can do to help save New Mexico's vanishing species; 9 a.m.-5 p.m., New Mexico Museum of Natural History and Science, 841-8837.

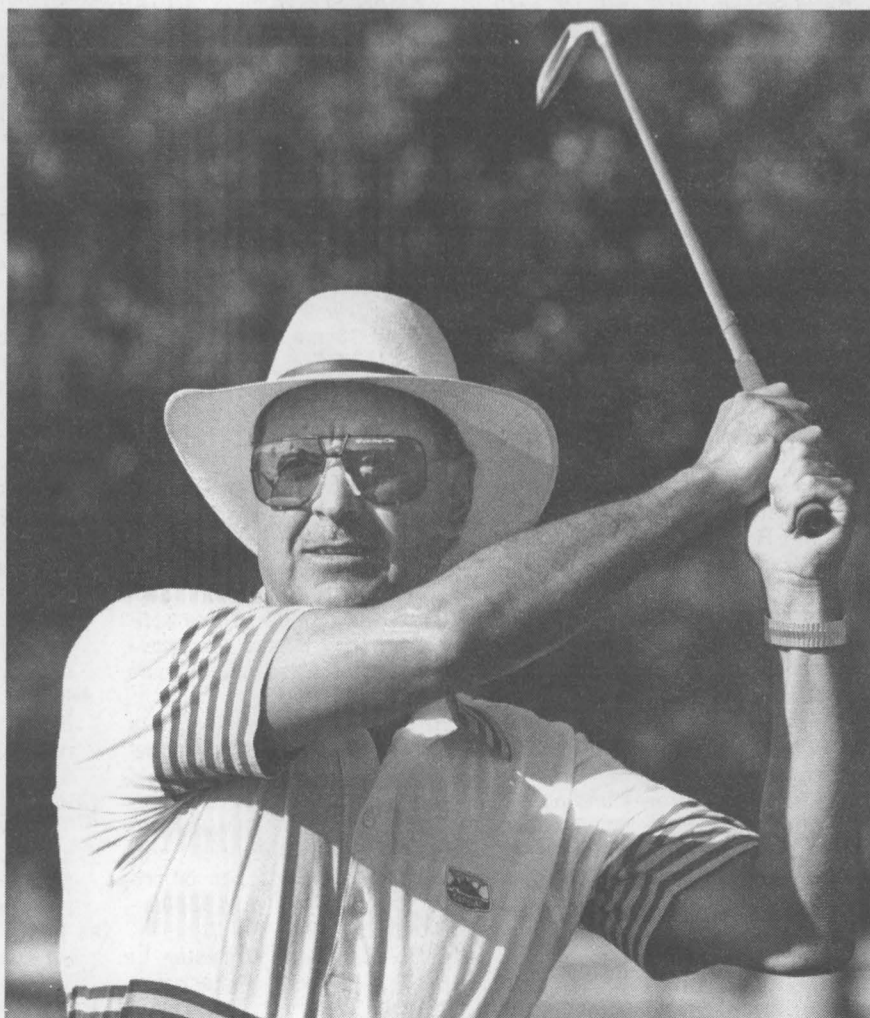
Sept. 29 — Heather Bishop Kids' Concert, popular Canadian children's entertainer; 1 & 3 p.m., KiMo Theatre, 764-1700.

Sept. 29 — Very Special Raspberry Festival: arts and foods featuring the regal and versatile raspberry, benefit for Carrie Tingley Hospital; 11 a.m.-2 p.m. brunch, 2-5 p.m. arts; La Posada de Albuquerque, 768-5188 or 243-6626.

Sept. 30 — San Geronimo Feast Day: Buffalo, Comanche, and corn dances, trade fair, ceremonial foot races, & pole climb; call for times, Taos Pueblo, 843-7270.

Oct. 3 — People of the Southwest Lecture Series: "World View and Pueblo Art and Architecture," by Rina Swentzell, architectural and educational consultant, lecturer, & writer; 7:30 p.m., Maxwell Museum of Anthropology, 277-4404.

Oct. 4-6 — Annual Grecian Festival: Greek food, dancing, arts & crafts; 11 a.m.-10 p.m. Fri. & Sat., 11 a.m.-8 p.m. Sun.; St. George Greek Orthodox Church (308 High St. SE), free, 247-9411.



MAYBE NOT READY yet to challenge Lee or Chi Chi, but Manny Vigil (2512) did himself proud by scoring a hole-in-one at the Tanoan Country Club on Aug. 11. To get his ace, he used a 6-iron on the 160-yard, par 3, second hole on the Club's Sandia Course. Manny's played golf for a number of years, but started playing regularly about five years ago, he says.